

EXHIBIT E: Mouse FucT-VII gene, from phage 104, annotated with DNA sequencing primers used to sequence the phage, with start and stop codons, and with relevant restriction sites. Mouse genomic DNA sequence displayed from position 25,277,900 to 25,282,400 containing the coding sequence for the mouse FucT-VII gene

CTACCTGCT	CTGGTTGGAC	GAGGGTCCAC	AAGGTCTCTT	AGGCTGGGTA	GAATAGAATG	60
GATGGGACGA	GACCAACCTG	CTCCAGGTG	TTCCAGAGAA	TCCGACCCAT	CTTATCTTAC	
TGTGATCCTG	ATCCTTGAAC	CCCAGATGTA	AAGCTGGGTT	TGGGTGCCCT	TGTGAGTGAG	120
ACACTAGGAC	TAGGACTTTG	GGTCTACAT	TTCCAGCCAA	ACCCACGGGA	ACACTCACTC	
GAGGCTGGT	GAGGTGAGGT	GGTATGTTGA	GGTCCCTCG	CTTTCCCTTT	GACTCATGAT	180
CTCCGGACCA	CTCCACTCCA	CCATACAAC	CCAGGGGACC	GAAAGGGAAA	CTGAGTACTA	
GTCTCACATT	CCCCCACC	CCTTTTCCAT	CCTGACCCCA	TTTCTGAGCT	AAATTTCCGA	240
CAGAGTGAA	GGGGGGTGG	GGAAAAGGTA	GGACTGGGGT	AAAGACTCGA	TTTAAAGGCT	
ACTGACTCTC	CAGTTGGCAA	GTTCTCATGG	TCAGGTGCCC	TACAGTTAAC	AGACCCGTGTG	300
TGACTGAGGA	GTCACCCGTT	CAAGAGTACC	AGTCCACGGG	ATGTCAAATTG	TCTGGGACAC	
GGACCTCTCT	CCAAACTGAG	CTGGCATGGG	GAGGGGGTCA	GTATAACAGC	AAGGCAGATG	360
CCTGGGAGGA	GGTTTGACTC	GACCGTACCC	CTCCCCAGT	CATATTGTCTG	TTCCGTCTAC	
TGGGGGAGGT	TCCTTCAAA	GCACCCAGGA	AGGGAAGAGC	ATGTGGGCGT	GGGTGAGGCT	420
ACCCCTTCCA	AGGAAGTTTA	GGTGGTCTCT	TCCTTCTCTG	TACACCCGCA	CCCACTCCGA	
GGGGCAAAGG	CCCCAGCCAG	CCTGGCGGCA	CAAAAGGAA	GGACAGCAGG	CTCTGGCAGC	480
CCCCGTTTCC	GGGGTCTGGT	GGACCGCCGT	GTGTTGCTCT	CCTGTCTGTC	GAGACCGTCTG	
CAGAAGCCTG	TGGCCCCAAG	CTGGCAGGAT	GGCCCCCTTC	CTGACAGTCC	CCCACAGCTG	540
GTCTTCGGAC	ACCGGGGGTT	GACCGTCTCA	CCGGGGGAAG	GACCTGTCAGG	GGGTGTCGGA	
TCTGGGTTC	TGACACGAGA	GAAGAGGTGG	GGCGGGGTGA	AGTGAACCTCT	GAAGCCAAAA	600
AGACCAAGG	ACTGTGCTCT	CTTCTCCACC	CCGCCCACT	TCACTTGAGA	CTTCGGTTTT	
TGTGACTCTC	CTGGGTGCAC	CAGCTTGGGG	AGAGGTGAAG	AAAGATGCCG	GGGCGGAAAC	660
ACACTGAGAG	GACCCAGTGT	GTGCAACCCC	TCTCCACTTC	TTTCTACGGC	CCCCCTTTG	
AAAGGGGCGAG	ATATCACTAT	GGTTATCTTA	CTAAGCACAG	AGTAACTGAA	AAAGCAAGGG	720
TTTCCCCGTC	TATAGTGATA	CCAATAGAAT	GATTCTGTCT	TCATTGACTT	TTTCTGTTCC	
TACCGCTGCC	CACCTCGTGC	CCACCTTACG	TTATACCTCA	AACCAAGCTAG	ATAGTTTCTG	780
ATGGCGAGG	GTGGAGCAG	GGTGAATGC	AATATGGAGT	TTGCTCGATC	TATCAAAGAC	
ATGGCACCCA	TACCTTCCCT	TCCCCTTTAG	GCATTGCGCA	AGCTCTCCAC	CACAATCTGG	840
TACCGTGGGT	ATGGGAGGGA	AGGGGAAATC	CGTAACGCGT	TCGAGAGGTG	GTGTTAGACC	
AAATTATAGC	CTGCAGAGGG	ATGGGCAGGG	CACCTTCTGAG	GTGCCAATCA	GCCTCTCACT	900
TTCAATATGG	GACGCTCCCC	TACCGTCCCC	GTGAAGACTC	CACGTTTACT	CGGACGTGAT	
GCCTCTGCCC	TGGCCATGGC	ACTGCTGTCA	GTTTCTTGGT	ACCTGTCTCA	ACAGCAGCCT	960
CGGAGACGGG	ACCGGTACCG	TGACGACAGT	CAAAGAACCA	TGGACAGAGT	TGTCGTCGGA	
TGTCACTGTA	GACTATGGCT	GGCGGTGGGG	GTGGGGGCG	GAATCCTAGA	AGCAGAGGAG	1020
ACAGTGCAC	CTGATACCGA	CCGCCACCCC	CACCCCCGTC	CTTAGGATCT	TCGTGTCCTC	
TGACATAGGG	TCGGGTCTGG	CAGAGCGAAG	TGTAGGAAGT	GATCCCCAAA	GGGATCTCTG	1080
ACTGATATCC	AGCCACAGCC	GTCTCGCTTC	ACATCCTTCA	CTAGGGGTTT	TAGTACGACC	
GGACGATCTG	GCCAACTAGT	TCCTCCCAT	CAAACTCCC	AGTCTGGAGC	TCTGGGACAT	1140
CCTGCTAGAC	CGGTTGTGAC	AGGAGGGTAA	GTTTTGAAGG	TCAGACCTCG	AGACCTGTGA	

EXHIBIT E

GGACAAGCCA	GGCCTGCTAT	TCTCCATACA	GGGCTCCATA	GTGTCTGGCT	CAGCAGAGTG	1200
CCTGTTCCGT	CCGGACGATA	AGAGGTATGT	CCCAGGATAT	CACAGACCGA	GTCGCTCCAC	
	8993				887B	
GGGGATCTGG	TGGGGATGGA	GGAAAGCTTAG	CTAAAAGCTT	TGTATAGGCT	GAAGCTCTGA	1260
CCCTTAGACC	ACCCCTACTT	CCTTCGAATC	GATTTTCGAA	ACATATCCGA	CTTCGAGACT	
GTGACCTGTC	TGGGCCACCC	TACCTTGGTC	TGGGCTGGGT	CATTGCATCC	CCAGATTGGA	1320
CACCTGGGACG	ACCCGCTGGG	ATGGGACCAG	ACCCGACCCA	GTAACGTAGG	GGTCTAACCT	
AGGCTTGGTG	AGATGGAGAG	GAACCTTGGC	TACAAGCTAT	AGCTTTGCCC	ACCAGAGCCT	1380
TCCGAACAC	TCTACCTCTC	CTTGGAAACG	ATGTTTCGATA	TCGAAACGGG	TGGTCTCGGA	
	3511B			671B		
GCTGGAGGGG	AATCAAAACAA	GCCTGGACCT	GAGGCTGGGA	CTAGCTTTCC	TGTTTCTGGA	1440
CGACCTCCCC	TTAGTTTGT	CGGACCTGGA	CTCCGACCTT	GATCGAAAGG	ACAAAGACCT	
	Start codon					946B
GTGGAATGCCA	ACCCCCCTGC	CACCAGCCTG	CCTGTCCACG	CCAGGGACAC	ACAGACTCCT	1500
CACCTACGGT	TGGGGGACGG	GTGGTCGGAC	GGACAGGTGC	GGTCCTGTG	TGCTGAGGA	
TCCTTTTCCA	GACTGGAAAG	CCCCCTCCTG	GGAGAGCAGG	AAGGAAGCAA	CCTGCAACTC	1560
AGGGAAGAGT	CTGACCTTTC	GGGGGAGGAC	CCTCTCGTCC	TTCCCTTCGT	GGACGTTGAG	
715B	2931B					
TTCCAGCCCT	GGACCTTGGG	CTGAACCTAC	AGTTCAAGGT	TTGTATGCTC	ACAGGTTCTT	1620
AAGGTCGGGA	CCTGGAACCC	GACTTGGATG	TCAAGTTCCA	AACATACGAG	TGTCAGAAC	
			2932B		Pst I	
GCAGGGAAAG	ATAAGAATCC	CCAGGGCACC	CTCCCCCCTG	CCCCCCAGTC	CAGTGCAGGT	1680
CGTCCCTTTC	TATTTCTTAG	GGTCCCGTGG	GAGGGGGGGC	GGGGGGTCAG	GTGACGTCCA	
AGCTCCTGGG	CTGTCCTTTC	AGGGCAAGTG	CTGACGCTCC	ATCAGACTGT	GATGGGGCCC	1740
TCGAGGACCC	AGACGGGAAG	TCCCGTTTAC	GACTCGGAGG	TAGTCTGACA	CTATCCCGGG	
			8661A			
TTTTCTGAGG	ATGACAATTC	TGAGAACAAG	GCAITTTTTCT	AGAGGTGGCA	GAACAGCATT	1800
AAAAGACTCC	TACTGTTAAG	ACTCTTGTTC	CGTAAAAAGA	TCTCCACCGT	CTTGTCTGTA	
TTGTGATGCC	CGAGGATCTG	GGAGCACAGG	TCCAGCTTAA	TGAGGGATTG	GAGGAAGTGG	1860
AACACTACGG	GCTCCTAGAC	CCTCGTGTCC	AGGTCGAATT	ACTCCCTAAC	CTCCTTCACC	
			911B			
GTATCATCAT	TACAGGGAGG	GGCCTCTGTG	GCCTCCTGGG	AAAAATGCAGT	TGCTCTCTTT	1920
CATAGTAGTA	ATGTCCTCC	CCGGAGACAC	CGGAGGACCC	TTTTTACGTCA	ACGAGAGAAA	
					9077	
GGGTGGCCTG	GGGTGTGTG	GTGGGCAGAG	GACGGAGGTG	CTCATTGGGG	GAAGGGATCA	1980
CCCACCGGAC	CCCACACAC	CACCCGTCTC	CTGCCTCCAC	GAGTAACCCC	CTTCCTTAGT	
CTTCTGCTCA	GAGTGTCTGC	AAGGGCCCTT	CCTTTTCTCT	AAGGCAAGCA	GGCCTCTCC	2040
GAAGACGAGT	CTCACGAGCG	TTCCCGGAAA	GGAAAGAGAC	TTCCGTTTCT	CCGGAGGAGG	
				9076	3445B	
TCCTCTCTTT	CCTCCTTCTC	CTCTTCTCTC	TCCTTCTCCA	TATGCTAGC	TGGTCAITTC	2100
AGGAGGAGAA	GGAGGAAGAG	GAGAAGGAGG	AGAAAGAGGT	ATACGGATCG	ACCAGTAAAG	

EXHIBIT E

						8953	
TAGGGACCAG	CATGGTTGGG	AAGGGGGCCT	TGTCTTGGCC	TTCCTCTTGT	CTCAATTCCC	2160	
ATCCCTGGTC	GTACCAACCC	TTCCCCCGGA	ACAGAACCGG	AAGGAGAAC	GAGTTAAGGG		
TCTTTGAGCA	GAAGACGGG	TGGGTGGGGT	AGGGTTGGAT	AGTGGTTGAT	GCCAAAGATT	2220	
AGAAACTCGT	CTTCTGGCCC	ACCCACCCCA	TCCCAACCTA	TCACCAACTA	CGGTTTCTAA		
						3512B	
GAAGGGGTAG	GGCGGGGCAG	AAGTGGGAAG	GTCCCTGGCT	TCCTCACCTT	GGTAGATGGT	2280	
CTTCCCCATC	CCGCCCCGCT	TTCAACCTTC	CAGGGACCGA	AGGAGTGGAA	CCATCTACCA		
GAGGAGCCCC	AGAGGTTGAG	CTGAGCAGCA	GCTGTGATT	CAGGGTGCC	CTGTTGGAGA	2340	
CTCCTCGGCT	TCTCAAACT	GACTCGTCGT	CGACACTAAA	CTCCACCGGA	GACAAACCTCT		
						8904	
GGCTGCTGTG	ATTTGAAAA	CTTCTTTCT	TGGTGACAAT	TCCAGAAAGC	TCCAGATGAA	2400	
CCGACGACAC	TAAACTTTTA	GAAGAAAGGA	ACCACTGTTA	AGGTCTTCCG	AGGTCTACTT		
						AflII	
TTGTATTGGT	GAGTGCCTGG	CCCTTAAGCA	GTCCCAGCTG	GGGATGATGG	GGATTTATGG	2460	
AACATAACCA	CTCACGGACC	GGGAATTCGT	CAGGGTCGAC	CCCTACTACC	CTCAAAATACC		
						8903	
GTGTCCCTGA	GCCTAGGGTG	ACAGGGCCTC	TCTTTTTTTT	TTTATTCTGC	TTACGGGTAC	2520	
CACAGGGACT	CGGATCCCAC	TGTCCCGGAG	AGGAAAAAAA	AAATAAGACG	AACTCCCATG		
						KpnI	
CACCCACCCA	GGAGGCTGCG	GGCCTGGGGC	GGCCTAGCTG	GAGGAGCAAC	ATTATATGGT	2580	
TGGGGTGGT	CTCCCGACGC	CCGGACCCCG	CCGGATCGAC	CTCCTCGTTG	TAAATACCAT		
ATTTGGTTTT	TCTGGCTGTG	GGGATCAGCT	CCTGGAAGTG	CCCGCTGGCC	TCAGTCCACA	2640	
TAAACCAAAA	AGACCGACAC	CCCTAGTCGA	GGACCTTCAC	GGGGACACGG	AGTCAGGTGT		
						624B	
CTCACCATCC	TTATCTGGCA	CTGGCCTTTC	ACCAACCGGC	CGCCAGAGCT	ACCTGGTGAC	2700	
GAGTGGTAGG	AATAGACCGT	GACCGGAAG	TGGTTGGCCG	GGGTCTCGA	TGGACCACTG		
						8874	
AGCTGCACCT	GCTATGGCAT	GGCCAGCTGC	CGTCTGAGTG	CTAACCCGAG	CCTGCTAGCC	2760	
TGCATGGTAG	GATAGCCGTA	CCGGTTCGAG	CGAGACTCAT	GATTGGCCTC	GGAGCATTCG		
						8867	
AGTGTGATG	CTGTGTCTT	CCACCACCGT	GAGCTGCAAA	CCCGCAATC	TCTCTACCC	2820	
TCACGACTAC	GACACCAAG	GGTGGTGGCA	CTCGACGTCT	GGGCCGTTAG	AGAGGATGGG		
						8851	
CTGGACCAGA	GGCCACACGG	ACAGCCTTGG	GTCTGGGCCCT	CCATGGAATC	GCCCAGTAAT	2880	
GACCTGGTCT	CCGGTGTGCC	TGTCCGAACC	CAGACCCCGA	GGTACCTTAG	CCGGTCATTA		
ACCCATGGTC	TCCATCGCTT	CCGGGGCATC	TTCAACTGGG	TGCTGAGCTA	TCGGCGTGAT	2940	
TGGGTACCAG	AGGTAGCGAA	GGCCCCGTAG	AAGTTGACCC	ACGACTCGAT	AGCCGCACTA		
						EcoRI	
TCAGATATCT	TGTACCCCTA	CGGTGCTTGG	GAGCCTCTCT	CTGGGCCCACT	ATCCCCACTA	3000	
AGTCTATAGA	AACATAGGTA	GCCAGCGAAC	CTCGGAGAGA	GACCCGGGTG	GAGCGGTGAT		
						8771	
CCGGCCAAAA	GCAGGATGGC	TGCTGGGGTG	ATCAGCAATT	TCCAGGAGCG	GCAGCAGCGT	3060	
GGCCGGTTTT	CGTCCCTACG	ACGGACCCAC	TAGTCGTAA	AGGTCCTCGC	CGTCTGCGCA		
						PstI	
GCAAAGCTGT	ACCGGACGCT	GGCCCTCAT	CTGCAGGTGG	ATGTTGTCGG	TCGGCCGAGC	3120	
CGTTTCGACA	TGCGCGTCGA	CCGGGGAGTA	GACGTCCACC	TACACAAGCC	AGCGCGGTG		
GGACGGCCCC	TATGGCGTAA	TTGTCGTGCT	CCCACTTTGG	CCCGGTACCG	CTTCTACCTG	3180	
CCTGCCGGGG	ATACCGGATT	AACAGACGAC	GGGTGAAACC	GGGCCATGGC	GAGATGGAC		
						8714	
GCCTTTGAGA	ACTCACAGCA	TCGGGACTAC	ATCACTGAGA	AGTTCGTGGC	CAATGCCCTG	3240	
CGGAAACTCT	TGAGTGTGCT	AGCCCTGATG	TAGTGACTCT	TCAAGACCGC	GTTACGGGAC		
						8715	
CGGGCTGGTG	CTGTACCCGT	GGCGCTGGGA	CCTCCTCGGG	CCACCTACGA	GGCTTTTGTG	3300	
GCGCGACAC	GACATGGGCA	CCGCGACCTT	GGAGGAGGCC	GGTGAGTGCT	CGGAAACAC		
						8715	
CCACCAAGATG	CCTTTGTACA	CGTGGACGAC	TTCAGCTCTG	CCCGTGAACT	GGCTGTCTTC	3360	
GGTGGTCTAC	GGAAACATGT	GCACCTGCTG	AAGTCGAGAC	GGGCATCTGA	CCGACAGGAG		

EXHIBIT E

CTCGTCAGCA GAGCAGTCGT	TGAATGAGAG ACTTACTCTC	TCGTTATCGT AGCAATAGCA	GGCTTCTTTG CCGAAGAAAC	CTTGGCGAGA GAACCGCTCT	CGGGCTCCGT GGCCGAGGCA	3420
GTGCGGCTCC CAGCCGAGG	TGGGTGACTG ACCCACTGAC	GAGGGAGCGC CTCCCTCGCG	TTCTGCACCA AAGACGTGGT	TCTGTGCCCG AGACACCGGC	CTACCCCTTAC GATGGGAATG	3480
TTGCCCCGCA AACGGGGCGT	GCCAGGTCTA CGGTCCAGAT	TGAAGACCTT ACTTCTGGAA	GAAAGCTGGT CTTTCGACCA	TCCAGGCTTG AGGTCCGAAC	Stop codon TTTCAGGACGA	8876 3540
GCTGGGAGAG CGACCCCTCT	GCTGGATGGG CGACCTACCC	TGGGAGACTG ACCTCTGAC	ATGTTGAAAC TACAACCTTG	CAAAGAGCTG GTTTCTCGAC	GGCATTCCAGG CCGTAGGTCC	3600
CTTTTGGTCA GAAAACCCAGT	CCATGGCACT GGTACCGTCA	ACCCCAAGGC TGGGGTTCCG	TTTTCTCTGT AAAAGGACAA	CAGTGAGCAG GTCACCTCTC	GAATTTCAGGA CTTAAGTCCT	3660
TATAAGGAGA ATATTCTCT	AAACTGGGCT TTTGACCCGA	GAGATGCCCT CTCTACGGGA	GGTGGGCTTT CCACCCGAAA	AGAGTAGGGG TCTCATCCCC	CCCAGGATAA GGGTCTTATT	3720
GAGACAATGA CTCTGTTACT	ATTAATGAGG TAATTACTCC	AGCATATGGG TCGTATACCC	GAAGGTGGCT CTTCCACCGA	GAGGGTCCCT CTCCACGGGA	GACTTACCTT CTGAATGGAA	3780
GACCCATGGC CTGGGTACCG	TGAAGGCTCC ACTTCCGAGG	ATGCCCATGG TACGGGTACC	CTGGAGCTGG GACCTCGACC	GACCCCTACAC CTGGGATGTG	TTCTATAGTC AAGATATCAG	3840
AAGGTGCTTA TTCCACGAAT	GCCTCAGAGT CGGAGTTCCA	TGCAGATGCA ACGCTACGCT	CCCTCTAGTA GGGAGATCAT	CTCTGGGTGC GAGACCCACG	AGACTGTACA TCTGACATGT	3900
CTGGGCGCAG GACCCGCGTC	GGGGTTGTGG CCCCAAACACC	AAGGACAGTG TTCCTGTGAC	CAGATGATTCT GTCTACTAAG	TGGGCTTTTG ACCCGAAAAC	ACACCACAGT TTTGGTGTCA	3960
TCCCCCAGGG AGGGGGTCCC	AAAGAGGCAC TTTCTCCGTG	TACTAATAAA ATGATTATTT	AACACTGACA TTGTGACTGT	End of cDNA (G, bold and underlined) gaaatctcct	GGTCAAGTCT CCAGTTTCAGA	4020
GTTAGGCAGC CAATCCGTCG	AGAGCTCAC TCTCGAGTGG	AGCCAGCTTC TCGGTCGAAG	CTCTGCTCAA GAGACGAGTT	TTCCCTCCGG AAGGGAGGCC	CAGCCATTAT TTCGGTAATA	4080
TGGGTTTCTC ACCCAAAGAC	GTTCCTGTCT CAAAGACAGA	GAGAGCCTTG CTCTCGGAAC	CTTGAGTGGT GAACTCACCA	ACCTTACCAG TGGAATGGTC	GAACTCAAAG CTTGAGTTTC	4140
CCCACGGCAG GGGTGCCGTC	GTACAGACCT CATGTCTGGA	GAGAACTGAG CTCTTGACTC	GTCAGACACA CAGTCTGTGT	GCTGTGGCTG CGACACCGAC	AGGTGCCACA TCCACGGTGT	4200
TGTCATAGGT ACAGTATCCA	CTCAGTGGGA GAGTCACCTC	GGTGTGTCTC CCACACAGGA	GTGTGATGGG CACACTACCC	GTGTGATGTA CACACTACAT	TCCGTTAGGG AGGCAATCCC	4260
CTTTCACTGA GAAAGTGACT	AGAGCCTGCT TCTCGGACGAG	GCAGGTGCCC CGTCCACGGG	ACTGTGTGGG TGACACAACC	ACTGGGTGGG TGACCCACCC	CCAGGAGGAG GGTCTCTCTC	4320
ATGAGAGGCT TACTCTCCAC	AGGCTATGAG TCCGATACTC	TGTATGACAG ACATACTGTC	ATTGAGCTCC TAACCTGAGG	TGGGATGGGC ACCCATACCG	TGGGGCTTGG ACCCCGAACC	4380
GTTTGTCCGG CAACAGGCC	GGATGGGGTG CCTAACCCAC	GCAGTACAGG CGTCATGTCC	CAGGAAGCTG GTCTTTCGAC	CCCTCCCCCT GGGAGGGGGA	GTGGTTTGTG CACCAAACAC	4440
GGAAAGGCTC CCTTTCGGGA	AAACATGGCT TTGGTACCGA	TCCTGCCCTA AGGACGGGAT	ATCTAGCCTC TAGATCGGAG	ATGGG TACCC		4485